IN THE CLAIMS:

1. **(currently amended)** A routing control method in a mixed environment of a network of a first type and a network of a second type, respectively defined by first and second address spaces, the first and second address spaces each having network-identifying and host-identifying portions, wherein the network of the first type provides routing control by referencing a subset of address bits of the network-identifying portion of the first address space, and the network of the second type provides routing control by referencing an entirety of address bits of the network-identifying portion of the second address space, comprising:

assigning the network of the second type a virtual hierarchy number that corresponds to the subset of address bits of the network-identifying portion of the first address space and identifies ~~a portion of the network of the first type at which the network of the second type is interfaced via a router~~ the network of the second type as a network of the first type subordinate to a router for routing the packet to the network of the first type,

attaching the virtual hierarchy number to a packet to be relayed at the router when the packet is to be relayed between the network of the second type and the network of the first type,

performing routing control by the virtual hierarchy number within the network of the first type, and

removing the virtual hierarchy number from the packet to be relayed at the router when the packet is to be relayed between the network of the first type and a network of the second type.

2. **(previously presented)** The routing control method as claimed in claim 1, wherein an address of the network of the second type is accommodated in an interface identification information block of an address format of the network of the first type, and the virtual hierarchy

number is accommodated in a hierarchy information block of the address format of the network of the first type for said routing control within the network of the first type.

3. (previously presented) The routing control method as claimed in claim 2, wherein each of one or more routers of the network of the first type comprises a first routing table that performs said routing control by using only the hierarchical information block as a key, and a second routing table that performs routing control by using the hierarchical information block and the interface identification information block as keys.

4. (previously presented) The routing control method as claimed in claim 3, wherein each of the one or more routers of the network of the first type uses the first routing table when relaying a packet between the network of the first type and another network of the first type.

5. (previously presented) The routing control method as claimed in claim 3, wherein each of the one or more routers of the network of the first type uses the second routing table when relaying a packet from the network of the first type to the network of the second type, and from the network of the second type to the network of the first type.

6. (currently amended) The routing control method s as claimed in claim 5, wherein the router interfacing the network of the first type with the network of the second type recognizes a packet relay from the network of the second type to the network of the first type, and from the network of the first type to the network of the second type, by using a receiving interface name and a transmission interface name when relaying the packet.

7. (currently amended) A routing control apparatus in a mixed environment of a network of a first type and a network of a second type, respectively defined by first and second address spaces, the first and second address spaces each having network identifying and host identifying portions, wherein the network of the first type provides routing control by referencing a subset of address bits of the network identifying portion of the first address space, and the network of the second type provides routing control by referencing an entirety of address bits of the network identifying portion of the second address space, comprising:

virtual hierarchy number assigning means for assigning the network of the second type a virtual hierarchy number that corresponds to the subset of address bits of the network-identifying portion of the first address space and identifies ~~a portion of the network of the first type at which the network of the second type is interfaced via a router~~ the network of the second type as a network of the first type subordinate to a router for routing the packet to the network of the first type, and for attaching the virtual hierarchy number to a packet to be relayed at the router when the packet is to be relayed between the network of the first type and the network of the second type,

routing control means for performing routing control of the packet by the virtual hierarchy number within the network of the first type, and

virtual hierarchy number removing means for removing the virtual hierarchy number from the packet to be relayed at the router when the packet is to be relayed between the network of the first type and a network of the second type.

8. (previously presented) The routing control apparatus as claimed in claim 7, wherein the virtual hierarchy number assignment means accommodates an address of the network of the second type in an interface identification information block of an address format of the network of the first type, and accommodates the virtual hierarchy number in a hierarchy information

block of the address format of the network of the first type for performing said routing control in the network of the first type.

9. (previously presented) The routing control apparatus as claimed in claim 8, wherein each of one or more routers of the network of the first type comprises a first routing table that performs said routing control by using only the hierarchical information block as a key, and a second routing table that performs routing control by using the hierarchical information block and the interface identification information block as keys.

10. (previously presented) The routing control apparatus as claimed in claim 9, wherein each router of the network of the first type comprises a first routing search means that performs routing search using the first routing table when relaying a packet between the network of the first type and another network of the first type.

11. (previously presented) The routing control apparatus as claimed in claim 9, wherein each router of the network of the first type comprises a second routing search means that performs routing search using the second routing table when relaying a packet from the network of the first type to the network of the second type, and from the network of the second type to the network of the first type.

12. (previously presented) The routing control apparatus as claimed in claim 11, wherein the router interfacing the network of the first type with the network of the second type includes recognition means that recognizes a packet relay from the network of the second type to the network of the first type, and from the network of the first type to the network of the second

type, using a receiving interface name and a transmission interface name when relaying the packet.

13. (previously presented) The routing control method as claimed in claim 1, wherein the network of the first type is an IPv6 network, and the network of the second type is an IPv4 network.

14. (previously presented) The routing control apparatus as claimed in claim 7, wherein the network of the first type is an IPv6 network, and the network of the second type is an IPv4 network.

15. (new) A routing control method in a mixed environment of a network of a first type and a network of a second type, respectively defined by first and second address spaces, the first and second address spaces each having network-identifying and host-identifying portions, wherein the network of the first type provides routing control by referencing a subset of address bits of the network-identifying portion of the first address space, and the network of the second type provides routing control by referencing an entirety of address bits of the network-identifying portion of the second address space, the method being directed to routing from the network of the second type to the network of the first type via a router and comprising the steps of:

receiving a routing information packet by a packet receiving unit of the router;

determining from a receiving interface name for the packet that the routing information packet has been routed from the network of the second type;

forwarding the routing information packet and the receiving interface name to a second network-type routing information processing unit of the router;

retrieving a virtual hierarchy number associated with the receiving interface name by the second network type routing information processing unit, the virtual hierarchy number corresponding to the subset of address bits of the network-identifying portion of the first address space and identifying the network of the second type as a network of the first type subordinate to the router;

writing first routing information to a routing table in a first network-type routing database unit of the router, the first routing information being written in a grouping with the virtual hierarchy number in the routing table of the first network-type routing database unit; and

writing second routing information to a routing table in a second network-type routing database unit of the router, the second routing information being written in a grouping without the virtual hierarchy number in the routing table of the first network-type routing database unit.

16. (new) A routing control method in a mixed environment of a network of a first type and a network of a second type, respectively defined by first and second address spaces, the first and second address spaces each having network-identifying and host-identifying portions, wherein the network of the first type provides routing control by referencing a subset of address bits of the network-identifying portion of the first address space, and the network of the second type provides routing control by referencing an entirety of address bits of the network-identifying portion of the second address space, the method being directed to routing from the network of the first type to the network of the second type via a router and comprising the steps of comprising:

receiving a routing information packet by a packet receiving unit of the router;

determining from a receiving interface name for the packet that the routing information packet has been routed from the network of the first type;

forwarding the routing information packet and the receiving interface name to a first network-type routing information processing unit of the router;

determining in the first network-type routing information processing unit whether routing address information of the routing information packet includes a virtual hierarchy number, the virtual hierarchy number corresponding to the subset of address bits of the network-identifying portion of the first address space and identifying the network of the second type as a network of the first type subordinate to the router; and

when the routing address information includes a virtual hierarchy number:

writing first routing information to a routing table in a first network-type routing database unit of the router, the first routing information being written in a grouping with the virtual hierarchy number in the routing table of the first network-type routing database unit, and

writing second routing information to a routing table in a second network-type routing database unit of the router, the second routing information being written in a grouping without the virtual hierarchy number in the routing table of the first network-type routing database unit.